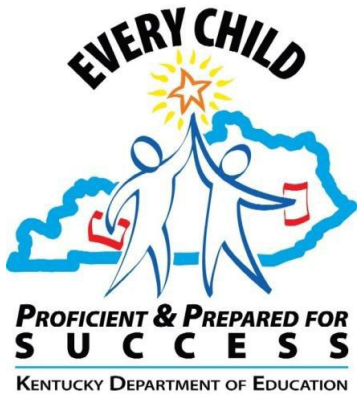
Fifth Grade – Mathematics

Kentucky Core Academic Standards with Targets



Grade Level/ Course: 5th Grade	
Standard with code:	**5.OA.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.**
Domain:	**Operations and Algebraic Thinking**
Cluster:	**Write and interpret numerical expressions.**
Type: _____Knowledge ___X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Use order of operations including parenthesis, brackets, or braces.	Evaluate expressions using the order of operations (including using parenthesis, brackets, or braces.)		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course: 5th Grade	
Standard with code:	**5.OA.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.** ***For example, express the calculation "add 8 and 7, then multiply by 2" as 2 x (8+7). Recognize that 3 x (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum of product.***
Domain:	**Operations and Algebraic Thinking**
Cluster:	**Write and interpret numerical expressions.**
Type: ___ ___Knowledge ___X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Write numerical expressions for given numbers with operation words. Write operation words to describe a given numerical expression.	Interpret numerical expressions without evaluating them.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course: 5th Grade	
Standard with code:	**5.OA.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms for two patterns, and graph the ordered pairs on a coordinate plane.** ***For example, given the rule "Add 3" and the starting number 0, and the given rule "Add 6" and the starting number 0, generate the terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.***
Domain:	**Operations and Algebraic Thinking**
Cluster:	**Analyze patterns and relationships**
Type: _____Knowledge ___X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Generate two numerical patterns using two given rules. Form ordered pairs consisting of corresponding terms for the two patterns Graph generated ordered pairs on a coordinate plane	Analyze and explain the relationships between corresponding terms in the two numerical patterns.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course (HS): 5th Grade	
Standard with code:	**5.NBT.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.**
Domain:	**Number and Operations in Base Ten**
Cluster:	**Understand the place value system**
Type: ___X___Knowledge _____Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.			

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course (HS): 5th Grade	
Standard with code:	**5.NBT.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.**
Domain:	**Number and Operations in Base Ten**
Cluster:	**Understand the place value system**
Type: _____Knowledge ___X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Represent powers of 10 using whole number exponents Fluently translate between powers of ten written as ten raised to a whole number exponent, the expanded form, and standard notation (10^3 = 10 x 10 x 10 = 1000)	Explain the patterns in the number of zeros of the product when multiplying a number by powers of 10. Explain the relationship of the placement of the decimal point when a decimal is multiplied or divided by a power of 10.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course (HS): 5th Grade	
Standard with code:	**5.NBT.3a Read, write, and compare decimals to thousandths:** **a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).**
Domain:	**Number and Operations in Base Ten**
Cluster:	**Understand the place value system.**
Type: ___X___Knowledge _____Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Read and write decimal to thousandths using base-ten numerals, number names, and expanded form.			

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course (HS): 5th Grade	
Standard with code:	**5.NBT.3b Read, write, and compare decimals to thousandths:** **b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.**
Domain:	**Number and Operations in Base Ten**
Cluster:	**Understand the place value system.**
Type: _____Knowledge ___X__Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Use >, =, and < symbols to record the results of comparisons between decimals	Compare two decimals to the thousandths based on the place value of each digit.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course (HS): 5th Grade	
Standard with code:	**5.NBT.4 Use place value understanding to round decimals to any place.**
Domain:	**Number and Operations in Base Ten**
Cluster:	**Understand the place value system**
Type: ___X___Knowledge _____Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Use knowledge of base ten and place value to round decimals to any place.			

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course: 5th grade	
Standard with code:	**5.NBT.5 Fluently multiply multi-digit whole numbers using the standard algorithm.**
Domain:	**Number and Operations in Base Ten**
Cluster:	**Perform operations with multi-digit whole numbers and with decimals to hundredths.**
Type: ___X___Knowledge _____Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Fluently multiply multi-digit whole numbers using the standard algorithm.			

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course: 5th Grade	
Standard with code:	**5.NBT.6 Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.**
Domain:	**Number and Operations in Base Ten**
Cluster:	**Perform operations with multi-digit whole numbers and with decimals to hundredths**
Type: _____Knowledge ___X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors	Use strategies based on place value, the properties of operations, and/or the relationship between multiplication and division to solve division problems. Illustrate and explain division calculations by using equations, rectangular arrays, and/or area models.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course : 5th Grade	
Standard with code:	**5.NBT.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.**
Domain:	**Number and Operations in Base Ten**
Cluster:	**Perform operations with multi-digit whole numbers and with decimals to hundredths**
Type: _____Knowledge ___X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Add, subtract, multiply, and divide decimals to hundredths using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	Relate the strategy to a written method and explain the reasoning used to solve decimal operation calculations.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course (HS): 5th Grade	
Standard with code:	**5.NF.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.** ***For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd)***
Domain:	**Number and Operations – Fractions**
Cluster:	**Use equivalent fractions as a strategy to add and subtract fractions**
Type: _____Knowledge ___X__Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Generate equivalent fractions to find the like denominator	Solve addition and subtraction problems involving fractions (including mixed numbers) with like and unlike denominators using an equivalent fraction strategy		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course (HS): 5th Grade	
Standard with code:	**5.NF.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g. by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.** ***For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7<1/2.***
Domain:	**Number and Operations – Fractions**
Cluster:	**Use equivalent fractions as a strategy to add and subtract fractions.**
Type: _____Knowledge ____X__Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Generate equivalent fractions to find like denominators	Solve word problems involving addition and subtraction of fractions with unlike denominators referring to the same whole (e.g. by using visual fraction models or equations to represent the problem) Evaluate the reasonableness of an answer, using fractional number sense, by comparing it to a benchmark fraction.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course (HS): 5th Grade	
Standard with code:	**5.NF.3 Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.** ***For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?***
Domain:	**Number Operations - Fractions**
Cluster:	**Apply and extend previous understandings of multiplication and division to multiply and divide fractions.**

Type: _____Knowledge ___X___Reasoning _____Performance Skill _____Product

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b).	Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers. (e.g. using visual fraction models or equations to represent the problem.) Interpret the remainder as a fractional part of the problem.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course : 5th Grade	
Standard with code: 5.NF.4a	**5.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.** **a. Interpret the product *(a/b)* x *q* as *a* parts of a partition of *q* into *b* equal parts; equivalently, as a result of a sequence of operations *a x q / b*. *For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)***
Domain:	**Number and Operations - Fractions**
Cluster:	**Apply and extend previous understandings of multiplication and division to multiply and divide fractions.**
Type: ___ ___Knowledge ___X___Reasoning _____Performance Skill __ ____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Multiply fractions by whole numbers. Multiply fractions by fractions	Interpret the product of a fraction times a whole number as total number of parts of the whole. (for example ¾ x 3 = ¾ + ¾ + ¾ = 9/4) Determine the sequence of operations that result in the total number of parts of the whole. (for example ¾ x 3 = (3 x 3)/4 = 9/4) Interpret the product of a fraction times a fraction as the total number of parts of the whole		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course : 5th Grade	
Standard with code:	**5.NF.4b Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.** **b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.**
Domain:	**Number and Operations - Fractions**
Cluster:	**Apply and extend previous understandings of multiplication and division to multiply and divide fractions.**
Type: ___ ___Knowledge _____Reasoning ___X___Performance Skill __ ____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Find area of a rectangle with fractional side lengths using different strategies. (e.g., tiling with unit squares of the appropriate unit fraction side lengths, multiplying side lengths)	Represent fraction products as rectangular areas. Justify multiplying fractional side lengths to find the area is the same as tiling a rectangle with unit squares of the appropriate unit fraction side lengths.	Model the area of rectangles with fractional side lengths with unit squares to show the area of rectangles.	

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course: 5th Grade	
Standard with code:	**5.NF.5a Interpret multiplication as scaling (resizing), by:** **a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.**
Domain:	**Number and Operations - Fractions**
Cluster:	**Apply and extend previous understandings of multiplication and division to multiply and divide fractions.**
Type: _____Knowledge ___X___ Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Know that scaling (resizing) involves multiplication.	Compare the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. *For example, a 2x3 rectangle would have an area twice the length of 3.*		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course: 5th Grade	
Standard with code:	**5.NF.5b Interpret multiplication as scaling (resizing), by:** **b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.**
Domain:	**Number and operations - fractions**
Cluster:	**Apply and extend previous understandings of multiplication and division to multiply and divide fractions.**
Type: _____Knowledge ___X___ Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Know that multiplying whole numbers and fractions result in products greater than or less than one depending upon the factors.	Draw a conclusion multiplying a fraction greater than one will result in a product greater than the given number. Draw a conclusion that when you multiply a fraction by one (which can be written as various fractions, ex 2/2, 3/3, etc.) the resulting fraction is equivalent. Draw a conclusion that when you multiply a fraction by a fraction, the product will be smaller than the given number.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course (HS): 5th Grade	
Standard with code:	**5.NF.6 Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.**
Domain:	**Number and Operations – Fractions**
Cluster:	**Apply and extend previous understandings of multiplication and division to multiply and divide fractions.**
Type: _____Knowledge __X__Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Represent word problems involving multiplication of fractions and mixed numbers (e.g., by using visual fraction models or equations to represent the problem.)	Solve real world problems involving multiplication of fractions and mixed numbers.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course (HS): 5th Grade	
Standard with code:	**5.NF.7abc Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.** [1] **[1]Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement at this grade.** **a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients.** ***For example, create a story context for (1/3) divided by 4, and use a visual fraction model to show the quotient. Use relationships between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) x 4 = 1/3.*** **b. Interpret division of a whole number by a unit fraction, and compute such quotients.** ***For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 x (1/5) = 4.*** **c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share 1/2 lb. of chocolate equally? How many 1/3 cup servings are in 2 cups of raisins?**
Domain:	**Number and Operations - Fractions**
Cluster:	**Apply and extend previous understandings of multiplication and division to multiply and divide fractions.**
Type: _____Knowledge ___X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	**Reasoning Targets**	**Performance Skills Targets**	**Product Targets**
Know the relationship between multiplication and division	Interpret division of a unit fraction by a whole number and justify your answer using the relationship between multiplication and division, and by creating story problems, using visual models, and relationship to multiplication, etc. Interpret division of a whole number by a unit fraction and justify your answer using the relationship between multiplication and division, and by representing the quotient with a visual fraction model. Solve real world problems involving division of unit fractions by whole numbers other than 0 and division of whole numbers by unit fractions using strategies such as visual fractions models and equations.		

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/Course (high School): 5th Grade	
Standard with Code:	**5.MD.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.**
Domain:	**Measurement and Data**
Cluster:	**Convert like measurement units within a given measurement system.**
Type: ___ Knowledge __X__ Reasoning _____Performance Skill _____Product	

Knowledge Targets	**Reasoning Targets**	**Performance Skill Targets**	**Product Targets**
Recognize units of measurement within the same system Divide and multiply to change units	Convert units of measurement within the same system Solve multi-step, real world problems that involve converting units		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course (HS): 5th Grade	
Standard with code:	**5.MD.2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations of fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.***
Domain:	**Measurement and Data**
Cluster:	**Represent and Interpret Data**
Type: _____Knowledge ___X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Identify benchmark fractions (1/2, 1/4, 1/8) Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8).	Solve problems involving information presented in line plots which use fractions of a unit (1/2, 1/4, 1/8) by adding, subtracting, multiplying, and dividing fractions.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course (HS): 5th Grade	
Standard with code:	**5.MD.3ab Recognize volume as an attribute of solid figures and understands concepts of volume measurement.** **a. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.** **b. A solid figure which can be packed without gaps or overlaps using *n* unit cubes is said to have a volume of *n* cubic units.**
Domain:	**Measurement and Data**
Cluster:	**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**
Type: __X___Knowledge _____Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Recognize that volume is the measurement of the space inside a solid three-dimensional figure. Recognize a unit cube has 1 cubic unit of volume and is used to measure volume of three-dimensional shapes. Recognize any solid figure packed without gaps or overlaps and filled with (*n)* "unit cubes" indicates the total cubic units or volume.			

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course (HS): 5th Grade	
Standard with code:	**5.MD.4 Measure volumes by counting unit cubes, using cubic cm, cubic in., cubic ft., and improvised units.**
Domain:	**Measurement and Data**
Cluster:	**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**
Type: ___X__Knowledge _____Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Measure volume by counting unit cubes, cubic cm, cubic in., cubic ft., and improvised units.			

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course (HS): 5th Grade	
Standard with code:	**5.MD.5a Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.** **a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number procedures as volumes, e.g., to represent the associative property of multiplication.**
Domain:	**Measurement and Data**
Cluster:	**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**
Type: _____Knowledge _____Reasoning __X____Performance Skill _____Product	

Knowledge Targets	**Reasoning Targets**	**Performance Skills Targets**	**Product Targets**
Identify a right rectangular prism. Multiply the three dimensions in any order to calculate volume (Commutative and associative properties)	Develop volume formula for a rectangle prism by comparing volume when filled with cubes to volume by multiplying the height by the area of the base, or when multiplying the edge lengths (LxWxH)	Find the volume of a right rectangular prism with whole number side lengths by packing it with unit cubes.	

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course (HS): 5th Grade	
Standard with code:	**5.MD.5b Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.** **b. Apply the formulas V=l x w x h and V=B x h for rectangular prisms to find volumes of right rectangular prisms with whole-number lengths in the context of solving real world and mathematical problems.**
Domain:	**Measurement and Data**
Cluster:	**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**
Type: _____Knowledge ___X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Know that "B" is the area of the base	Apply the following formulas to right rectangular prisms having whole number edge lengths in the context of real world mathematical problems: Volume = length x width x height Volume = area of base x height		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course (HS): 5th Grade	
Standard with code:	**5.MD.5c Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.** **c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.**
Domain:	**Measurement and Data**
Cluster:	**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**
Type: _____Knowledge ____X__Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Recognize volume as additive.	Solve real world problems by decomposing a solid figure into two non-overlapping right rectangular prisms and adding their volumes.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course (HS): 5th Grade	
Standard with code:	**5.G.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).**
Domain:	**Geometry**
Cluster:	**Graph points on the coordinate plane to solve real-world and mathematical problems.**
___X___ Knowledge _____Reasoning _____Performance _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Define the coordinate system Identify the x- and y-axis Locate the origin on the coordinate system Identify coordinates of a point on a coordinate system Recognize and describe the connection between the ordered pair and the x- and y-axis (from the origin)			

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course (HS): 5th Grade	
Standard with code:	**5.G.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.**
Domain:	**Geometry**
Cluster:	**Graph points on the coordinate plane to solve real-world and mathematical problems.**
Type: ____Knowledge __X__Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Graph points in the first quadrant	Represent real world and mathematical problems by graphing points in the first quadrant Interpret coordinate values of points in real world context and mathematical problems		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course (HS): 5th Grade	
Standard with code:	**5.G.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.**
Domain:	**Geometry**
Cluster:	**Classify two-dimensional figures into categories based on their properties.**
Type: __X___Knowledge _____Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Recognize that some two-dimensional shapes can be classified into more than one category based on their attributes. Recognize if a two-dimensional shape is classified into a category, that it belongs to all subcategories of that category.			

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.

Grade Level/ Course (HS): 5th Grade	
Standard with code:	**5.G.4 Classify two-dimensional figures in a hierarchy based on properties.**
Domain:	**Geometry**
Cluster:	**Classify two-dimensional figures into categories based on their properties.**
Type: _____Knowledge __X____Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Recognize the hierarchy of two-dimensional shapes based on their attributes.	Analyze properties of two-dimensional figures in order to place into a hierarchy. Classify two-dimensional figures into categories and/or sub-categories based on their attributes.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Copyright © 2011 Kentucky Department of Education
The content of this document constitutes original works of authorship owned by the Kentucky Department of Education (KDE) and may not be reproduced without the express, written permission of the KDE.